

JAPANESE
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[JP,06-045998,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE  
INVENTION TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF  
DRAWINGS DRAWINGS

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[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] In the program control-type pocket transmitter which has a central processing unit, storage is possible without a power source. With an electrical signal The rewritable storage element which can be written, The interface section equipped with the electric type or the optical type connector for reading the program of operation for operating as a pocket transmitter from an external device, It has the read-only storage element which memorized the initial program for reading said program of operation and performing write-in actuation to said storage element which can be written. This initial program The pocket transmitter characterized by starting the writing of said program of operation only when the personal identification number which was equipped with the \*\*\*\* personal identification number of this pocket transmitter, and was inputted from the external device, and said \*\*\*\* personal identification number are in agreement.

[Claim 2] The pocket transmitter according to claim 1 characterized by concealing the connector according to claim 1 for reading a program of operation from an external device with housing covering interlocked with the switch which was installed inside in the housing of a pocket transmitter and was connected to the power circuit of a transmitter.

[Claim 3] The pocket transmitter according to claim 1 or 2 which has the display which operates with an electrical signal on housing external surface, and is characterized by displaying the formal number of this program of operation on said display by operating the program of operation which has memorized.

[Claim 4] The program rewriting equipment of the pocket transmitter according to claim 1 characterized by to have the input unit which inputs the number to which two or more pocket transmitters connected to the pocket transmitter according to claim 1 in the program rewriting equipment for sending in said program of operation at two or more interface sections which have the electric type or the optical type connector for connecting with coincidence in two or more sets of pocket transmitters, and this interface section \*\*\*\* in the \*\*\*\* personal identification number according to claim 1 which it has in each.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the portable transmitter controlled by the central processing unit to build in.

[0002]

[Description of the Prior Art] There are some which use the central processing unit (it is henceforth called CPU) for the control in the conventional portable transmitter. The program of operation for operating CPU is required to control using CPU. Here, the conventional example is explained to an example for telephone equipment. Drawing 9 is the block diagram of telephone equipment similar to being shown in JP,62-116099,A, and explains the conventional portable transmitter with this drawing. In addition, it is henceforth called a transmitter about either telephone equipment or a portable transmitter.

[0003] In drawing 9, 31 shows a transmitter, the power supply section where 28 constitutes a transmitter, and 30 call it a control section with the wireless transceiver section, an indicating equipment, a push-button, etc., and 34 calls it the Radio Communications Department henceforth. When operating CPU1, CPU by which 1 controls a transmitter 31, the read only memory (it is henceforth called ROM) which contains the program of operation 2 operates [ program ] CPU1, and 3 The storage element (it is henceforth called RAM) which memorizes data with the need of memorizing temporarily etc. and which can be written, the signal bus-bar (it is henceforth called a bus) to which 4 connects CPU1, and ROM2 and RAM3, and 5 are the programs of operation for operating CPU1 contained by ROM2.

[0004] The control section 30 consists of required surrounding electronic parts, wiring, etc. which are not illustrated, when operating CPU1, ROM2 and RAM3, a bus 4, and these as hardware. Moreover, the transmitter 31 consists of a control section 30, the Radio Communications Department 34, a power supply section 28, wiring between them which are not illustrated, etc.

[0005] An example of the appearance of the conventional transmitter 31 is shown in transmitter outline drawing of drawing 10. The indicating equipment for housing covering with which 8 can remove a housing and 9 from a housing 8, and 17 displaying information required for a communication link, for example, a frequency, the other party's telephone number, the residue of a power source, etc. in drawing, and measuring an operator's facilities, and 40 are push-buttons. In addition, the push-button 40 and the indicating equipment 17 are contained with the block diagram of drawing 9 in the Radio Communications Department 34.

[0006] Next, the block diagram of drawing 9 explains actuation. In a transmitter 31, although other transmitters (not shown) or the communication link with a dial office (not shown) is performed by a power source being supplied by the Radio Communications Department 34 from a power supply section 28, operating a request is given to the Radio Communications Department 34 by the control section 30. The program 5 of operation for operating CPU1 beforehand is carried in ROM2 using the write-in equipment of the dedication which is not illustrated in the control section 30.

[0007] Even if ROM2 does not have a power source, the program 5 of operation carried does not

disappear. If the power supply section 28 of a transmitter 31 is switched on, CPU1 will read the program 5 of operation carried in ROM2, and will start necessary actuation according to this. Although a part or all of the program 5 of operation may be transmitted to RAM3 if needed when operating, the program 5 of operation carried in ROM2 even in this case was not erased, and remains. RAM3 has memorized the password for the protection at the time of rewriting data with the need of memorizing temporarily when CPU1 performs control and an operation, for example, system data, and system data etc. After a password exchanges at the time of starting of a system, i.e., the cell of a transmitter 31, it can be set as arbitration with a push-button 40. [0008] A password is anew entered from a push-button 40, and only when this is in agreement with the password contained by RAM3, rewriting is performed in rewriting of the system data contained by RAM3. Although the thing of various formats is used for ROM2, like the pocket transmitter, stored data is eliminable, and the integrated circuit device which can make rewriting possible is inserted in the socket of dedication by only UV irradiation, and is used for the thing with the need of making it operating, it being small and carrying, by it. Since such a component does not need a power source for informational storage maintenance, even when exchanging the cell (not shown) of the power supply section 28 of a transmitter 31, a program does not disappear.

[0009] However, the program 5 of operation is not everlasting, for example, when as follows, it needs modification. If the case of portable telephone is explained as an example of a transmitter 31, in routing to the message other party, the cheap root of a tariff is automatically chosen from different telephone company lines of the 2 or more roots by telephone, the actuation which chooses the optimal root is required and the program for it is also included in the program 5 of operation.

[0010] However, a tariff needs to exchange the program 5 of the telephone of a large number which attain to tens of thousands of [ including the above-mentioned program ] of operation which is not often changed, and was manufactured and sold in the past for whenever [ of amendment of the tariff of each telephone company / every ] in order not to give a user disadvantageous profit since the result which does not suit the present condition by the old program came out for a short period of time.

[0011] Drawing 11 is the transmitter internal structure Fig. showing the situation that ROM2 is used for the conventional transmitter 31. 2, 8, and 9 are the same as that of drawing 9 and drawing 10 in drawing. The socket in which 6 inserts ROM2, the substrate with which 7 has attached the socket 6, and 18 are the formal numbers of the program 5 of operation written down in the front face of ROM2. Drawing shows the condition of removing the housing covering 9, on account of explanation.

[0012] although otherwise although not shown in drawing and most is arranged on the substrate 7, there is no need for explanation -- it comes out -- it is omitting. [ on circuitry including CPU1, RAM3, or them ] [ required electronic parts ] The activity from which ROM2 inserts ROM2 in a socket 6, or removes it since about 20-40 electrode guide pegs 10 are generally formed is handicraft, and if it does not pay and carry out careful cautions, a guide peg may break, and it may bend, a socket, or it may damage other surrounding components.

[0013] That is, it is difficult for an amateur, and in order that a special engineer may also carry out carefully, if exchange of ROM2 is only one set, it is easy, but when there is much number, it is the bad activity of working efficiency with large fatigue.

[0014] The approach of specifying the owner of the transmitter 31 which needs exchange of the program 5 of operation, and mailing ROM2 for exchange Since it is impossible, from that there is very much number of selling, and the reason it is told to an amateur that are difficult as exchange mentioned above the exchange approach of ROM2 ROM2 for exchange to which the manufacture manufacturer of a transmitter 31 released the formal number 18 of the program 5 of the format which needs exchange to the end user, and carried the new program 5 of operation in the electrical appliances store or the dial office first, The engineer who performs exchange is made to stand by and the approach of carrying out exchange of every one transmitter 31 which the user brought is taken.

[0015] Since it is necessary to read the formal number 18 which discovered ROM2 and was

written there out of the electronic parts of many which opened the housing covering 9 in order for an owner to know the formal number of the program 5 of operation carried in ROM2, and have been arranged intricately which are not illustrated, it is difficult for an amateur's general owner.

[0016]

[Problem(s) to be Solved by the Invention] Since the conventional pocket transmitter is constituted as mentioned above, if it is one transmitter, as the 1st technical problem Although exchange of a program of operation is not a time-consuming activity so much, either, in carrying out exchange of the program of a lot of sold transmitters at 1 cause Since there is also the number of activity engineers from the viewpoint of business, the owner who brought the transmitter for exchange has to do long duration turn waiting, or Or it will be necessary to deposit a transmitter in an electrical appliances store for several days, and there was a trouble said that workability is not good in the semantics said that it is unexchangeable that the inconvenience of being unable to use a transmitter in the meantime arises etc. in a short time.

[0017] Moreover, as the 2nd technical problem, if it reregisters with arbitration even if it does not know a personal identification number although protection by the personal identification number registered into RAM at the time of system starting is made, rewriting of system data can be freely performed for rewriting of the system data contained to RAM. Moreover, in exchange of ROM, since protection of what was not performed, either, when the 3rd malicious person existed, the problem referred to as being easily exchanged for ROM including the converted program of operation was.

[0018] Moreover, as for the owner of a transmitter, in long-term duration of service, it is common as the 3rd technical problem for the formal number of the program of operation carried in the transmitter to own to have been what, or to forget. Moreover, the formal number of the program of operation is known only by an owner looking at a transmitter from the outside. For this reason, even if the transmitter manufacturer performed the appeal of program exchange, an owner did not perform the proposal of exchange but there was a problem referred to as that the transmitter which has the program of operation which does not suit the present condition as a result continued being used as it is.

[0019] Moreover, as the 4th technical problem, even when a special operator carried out, in exchange of a program of operation, i.e., exchange of ROM, there was no exchange of dedication etc., and since it could not but perform one set at a time manually, the problem said that working efficiency is low was.

[0020] It was not made in order that this invention might cancel the above troubles, and by changing exchange of a program of operation into the simple activity which does not need so much prudence, one is improving the workability of the simultaneous exchange activity of the program of a lot of transmitters of operation, and, thereby, it aims at reducing the latency time of the owner who brought the transmitter for exchange of a program.

[0021] Moreover, although the above-mentioned exchange is made easy, it aims at making it the system or structure where it is too easy and reconstruction by the 3rd malicious person etc. is not performed simply to the 2nd.

[0022] Moreover, of what kind of form the program of operation carried in the transmitter present in use the 3rd is a thing is completely being able to know easily also to an amateur's general owner at a technique, and memorizing the formal number of a program again.

[0023] Moreover, the rewriting working efficiency of a program is improved to the 4th, and it is provided with the program rewriting equipment which can reduce further the rewriting latency time of the owner who brought the transmitter for program rewriting.

[0024]

[Means for Solving the Problem] About a pocket transmitter, the following means are used among the pocket transmitter concerning this invention, and its program rewriting equipment. Maintenance of storage is possible without a power source as a storage element which memorizes the program of operation in the 1st, and it has the interface section which has the electric type or the optical type connector for reading the new program of operation which should rewrite using RAM in which informational read-out and informational writing are possible

with an electrical signal from external equipment, and it has the ROM which contained in the initial program which specified the actuation in the transmitter for writing said new program of operation in RAM.

[0025] Furthermore, this initial program starts write-in actuation of the new actuation program to said RAM, only when only the manufacturer knows, the personal identification number inputted from the external device and the personal identification number of said \*\*\*\* are contrasted, including the personal identification number data of \*\*\*\* of a pocket transmitter about which an owner is not told and this is in agreement.

[0026] As a connector of the interface section which reads said new program of operation into the 2nd from an external device further in addition to the 1st means, it is prepared in the housing of a transmitter, a switch is formed in housing covering which covers this connector, using the connector which has not been exposed outside, and this switch is connected to the power source of a transmitter.

[0027] When operating a transmitter further in addition to the 1st or 2nd means, the display with which the formal number of the program of operation carried actually is displayed is prepared in transmitter external surface the 3rd.

[0028] Next, it is carrying out to what has equipment which inputs the personal identification number shown in the 1st means of two or more sets of the transmitters connected to two or more interfaces the electric type which is program rewriting equipment which sends a program of operation into a transmitter from the exterior, and accesses two or more sets of transmitters about program rewriting equipment at coincidence in order to rewrite the program of the transmitter shown in the 1st means of operation, or with an optical type connector, and this interface.

[0029]

[Function] Since a program of operation is contained by RAM, what is constituted as shown in the 1st [ of the transmitter by this invention ] of a means connects to an external device the connector prepared in the interface section on the occasion of that rewriting, is reading a new program of operation from an external device, and can perform rewriting of a program of operation. Moreover, unless it inputs the same number as the personal identification number written in the initial program carried in ROM from an external device, rewriting of a program of operation is not started.

[0030] If the connector which reads a new program of operation is prepared in the interior of a transmitter and does not disassemble covering of a housing, since it cannot connect the connector for rewriting, the transmitter of a configuration of being shown in the 2nd of a means has the operation to which an unprepared mischief is not carried out. Moreover, with the switch formed in housing covering, when housing covering is opened, a transmitter is turned off and there is an operation of easy mischievous prevention similarly.

[0031] In addition, when operating a transmitter further, an operator only reads the formal number of the program of operation displayed on the transmitter front face. an operation according [ the transmitter of a configuration of being shown in the 3rd of a means ] to said 1st means, and the operation by the 2nd means — There is an operation which the format of the program of operation carried in this transmitter is what, or is actually referred to as being able to know easily without needing special technological knowledge.

[0032] As for the program rewriting equipment of a configuration of being shown in the 4th of a means, one program rewriting equipment can rewrite the program of two or more sets of transmitters of operation to coincidence at coincidence. Therefore, it acts so that effectiveness of the rewriting activity of the program of a lot of transmitters of operation may be made high.

[0033]

[Example] The control-section block diagram of drawing 1 explains one example of this invention below example 1. Since 30 is the same as usual as 1, 3-5 in drawing, explanation is omitted. 11 is the storage element which can be written and the interface section for what does not need a power source for maintenance of storage (for there to be a flash memory, an ELECTRICALLY ERASABLE AND PROGRAMMABLE ROM, etc., for example, although it is henceforth called EEPROM), and 12 to connect EEPROM11 and the external device which is not illustrated, and 13

are the connectors of the electric type which connects an external device with the interface section 12, or an optical type.

[0034] It is read-only and initial-program write-in equipment (it is henceforth called IPL) for 14 to perform actuation which reads the program 5 of operation from an external device (not shown) via a connector 13 and the interface section 12 regardless of whether the program 5 of operation is carried, and is written in EEPROM11, and 15 are storage elements which were built into IPL14 and which do not need a power source for storage maintenance. Since the locations currently used although it is the same object as ROM2 differ, in order to distinguish component hardware, it calls it IPLROM henceforth for convenience. 16 is an initial program which carries out the aforementioned predetermined actuation to IPL14, and is carried in IPLROM15. 19 is the personal identification number of \*\*\*\* of the transmitter 31 contained in the initial program 16. An owner was not told about the personal identification number, but only the manufacturer of a transmitter 31 knows it.

[0035] In order to explain the configuration of an example 1 in more detail, the outline of the program included in the initial program 16 and the program 5 of operation of the manufacture department 30 of drawing 1 or data is shown in Table 1. Although the program 5 of operation can also be further divided into a detail in Table 1, since there is no need here, it is not shown for details.

[0036]

[Table 1]

プログラム 種 別	搭載されているプログラムまたはデータ
初 期 プログラム (16)	1) インターフェース等を駆動して、外部装置から、 新しい動作プログラムを読み込むためのプログラム。
	2) PRAMに入っている動作プログラムを新しい プログラムで書き換えるためのプログラム。
	3) 通信機固有の暗証番号。
	4) 外部装置から入力された暗証番号と、固有の暗証 番号を比較し、一致した場合のみ2)に示す書き 換えを開始するプログラム。
動 作 プログラム (5)	1) 通信機としての動作のためのプログラム。
	2) プログラム形式番号。
	3) プログラム形式番号の表示動作プログラム。

[0037] In the control section 30 of drawing 1 , since maintenance of storage is possible for it even if EEPROM11 does not have a power source, the program 5 of operation which has been memorized also in removing in order to exchange the cell (not shown) of a power supply section 28 etc. is not lost. Moreover, since rewriting of the memorized information can perform EEPROM11 easily only with an electrical signal, when the carried program 5 of operation needs to be rewritten, the program 5 of operation is rewritten with the following procedure.

[0038] First, the external device (not shown) which has the new program 5 of operation which should be rewritten is connected to a connector 13. Next, it inputs into the external device which does not illustrate the same input number (not shown) as the personal identification number 19 contained in the initial program 16. If said input number is sent to the interface section 12 through a connector 13 from an external device, within a transmitter, the old program 5 of operation memorized will stop, an initial program 16 will start, and the following actuation will be advanced according to an initial program 16.

[0039] First, in a control section 30, when the comparison with the sent input number and the personal identification number 19 of transmitter \*\*\*\* contained in the initial program 16 from the first is performed and it is in agreement with \*\*, a coincidence signal (not shown) is sent. In response to this coincidence signal, an external device turns the new program 5 of operation to a control section 30, and transmits, and the new program 5 of operation is written in in EEPROM11 by the control section 30. Although the old program 5 of operation will naturally be eliminated at this time, since a series of the above-mentioned actuation of all is performed by the initial program 16 contained in IPL14, rewriting of a program etc. produces no trouble at all.

[0040] Here, the personal identification number 19 of transmitter \*\*\*\* is a \*\*\*\* number of the format of that transmitter, and only the manufacturer of this transmitter grasps. Thereby, the opportunity of reconstruction of a program with the 3rd malicious person's, for example, a transmitter owner, mischief can be reduced.

[0041] One example of the transmitter of the example 2. example 2 is shown in the perspective view of drawing 2 . Since the inside 7-9 of drawing is the same as that of the conventional example, explanation is omitted. 13 shows the attachment condition of the connector 13 in drawing 1 . 29 is a switch which operates by closing motion of the housing covering 9. If the housing covering 9 is not opened in drawing 2 , and it has the structure where an external device (not shown) is not connectable with a connector 13 and does not have the knowledge of fixed level, it has structure whose actuation is impossible.

[0042] An example of a circuit including the switch 29 of the transmitter shown in drawing 2 is shown in the power circuit Fig. of drawing 3 . 31 in drawing shows the whole transmitter, 32 is the cell of a power supply section 28, and 33 is diode. The terminal a of a connector 13 is connected to the plus side of the power supply terminal of a control section 30 after Terminal b is connected to the cathode side of diode 33 on the plus pole of a cell 32 again. a and b terminal have connected 35 with \*\* too hastily by the other party connector of the external device (not shown) inserted in a connector 13. Although not illustrated, wiring for transmitting a program is connected to terminals other than a of a connector 13 and the other party connector 35, and b. [0043] Since a switch 29 serves as close, and it will serve as open if the housing covering 9 is removed if the housing covering 9 is closed, where the housing covering 9 is removed, a power source is not supplied to the Radio Communications Department 34, but a communication link is impossible. If the housing covering 9 is closed, a power source will be directly supplied to the Radio Communications Department 34 through diode 33 also to a control section 30, and actuation of all the circuits in a transmitter 31 will be attained.

[0044] Even if a connector 13 is inserting the other party connector 35 and the switch 29 has not closed it by the short circuit of the other party connector 35 which should be inserted, a power source is supplied only to a control section 30. Therefore, the housing covering 9 is opened, and the preparation which will rewrite a program if the other party connector 35 of the dedication which prepared the short circuit is used is prepared, and fault, like a message call starts from the exterior during rewriting can also be prevented.

[0045] The method of forming a short circuiting switch on a substrate 7 as an approach of replacing with a short circuit by the connector 13 and the other party connector 35 which were



shown in drawing 3 may be used. Moreover, the connector only for short circuits suitable on a substrate may be prepared. Moreover, you may carry out using a photodiode or a reed switch etc.

[0046] An example Fig. of the appearance of the transmitter of this invention example 3 is shown in example 3. drawing 4 . Although 17 in drawing is a display similar to the display shown in the conventional example, it has the display function of the formal number 18 shown below. Although there is no need in the usual communication link actuation, the formal number 18 of the program 5 of operation is automatically displayed on a display 17, when a transmitter operates.

[0047] the operator of a transmitter reads the formal number 18 — moreover, the program 5 of the transmitter 31 which he owns of operation can judge whether it is what requires updating by getting to know the program formal number which one side takes updating released from a transmitter manufacturer or a dial office.

[0048] The transmitter block diagram for displaying the formal number 18 of drawing 4 is shown in drawing 5 . When the power source of a transmitter 31 is switched on, after the formal number 18 of the program of operation contained in the program 5 of operation in EEPROM11 is transmitted to 1 \*\* RAM 3, it is read to a register 36. As a result of the data of a register 36 driving a display 17 via a driver 37, the formal number 18 of the program 5 of operation is displayed on a display 17. In addition, since the formal number 18 is written in in the program 5 of operation, if the program 5 of operation is updated, the formal number 18 will also be updated.

[0049] Example 4. drawing 6 is the block diagram showing an example of the configuration of the program rewriting equipment of this invention. The central processing unit (it is henceforth called CPU) with which 20 controls program rewriting equipment and 21 controls program rewriting equipment 20 in drawing, and 22 are the stores which should be rewritten and which contained the new program of a transmitter 31 of operation, for example, the floppy disk or the read-only storage element is used (it is henceforth called F.D). 23 is a keyboard for people to operate program rewriting equipment 20, and can input a personal identification number (it is called henceforth T.B).

[0050] 24 is an interface which has the other party connector 35 for combining with a transmitter 31, and two or more sets of I.F24 and the connectors 35 which are called henceforth I.F are used. 25 is a communication link bus-bar which connects CPU21, and F.D22, T.B23 and two or more I.F24 to \*\*.

[0051] The transmitter 31 shows the condition that two or more sets were connected to program rewriting equipment 20. It is enough for the completely same output as coincidence not to be outputted to two or more other party connectors 35 in strict semantics, and to output to coincidence by the so-called time sharing or the batch-processing technique with program rewriting equipment 20, at extent which people sense as coincidence.

[0052] An example of the appearance of program rewriting equipment 20 is shown in drawing 7 . When using program rewriting equipment 20, after loading a new program of operation in F.D22 first, the transmitter 31 of the number required for two or more other party connectors 35 is connected. Next, the same number (it is henceforth called an input number) as the \*\*\*\* personal identification number 19 of the number of connection of a transmitter 31 is inputted from T.B23.

[0053] If a rewriting initiation command is inputted from T.B23 after all inputs are completed, program rewriting equipment 20 will transmit a new program of operation to two or more transmitters 31 to what it has been answered to the coincidence signal which showed the sequential input number to delivery and the inner example 1 of a transmitter 31 as. By actuation explained to the example 1, a transmitter 31 reads a new program of operation, and rewrites an old program of operation.

[0054] A part of power circuit of other examples 5 of this invention is shown in example 5. drawing 8 . The one electrode is connected to one electrode of the optical generation-of-electrical-energy component 41 and the power supply terminal of RAM3 by the optical generation-of-electrical-energy component for which 41 generates an electrical potential difference in response to an external light in drawing, and the cell only for RAM which 42 can charge [ which is used for RAM3 in dedication ]. In order that 43 may carry out ON OFF of the power source of a transmitter 31, the switch connected to the cell 32 and 44 are antisuckback

diodes, and are used for the antisuckback of the optical generation-of-electrical-energy component 41, the antisuckback to the cell 42 only for RAM, and the antisuckback to a cell 32.

[0055] In the case of drawing 8 , the program 5 of operation memorized even if the required electrical potential difference of RAM3 is always secured by the cell 42 only for RAM at least and it removes a cell 32 for exchange does not disappear. Moreover, by the optical generation-of-electrical-energy component 41 or the cell 32, the cell 42 only for RAM is charged, whenever it is opportune. Cheap RAM3 (the so-called static RAM) can be used instead of generally using expensive EEPROM11 as a storage element of the program 5 of operation according to this approach, and it has the effectiveness referred to as economical.

[0056]

[Effect of the Invention] Since sampling of the read-only component which time and effort requires on the occasion of modification of a program of operation since the pocket transmitter of this invention does not use a read-only component for the storage element of a program of operation, and does not need a power source for storage maintenance but the storage element which can be written is used, and insertion are lost and it becomes rewritable in a program of operation by the signal, it has the effectiveness say that workability improves when rewriting a lot of pocket transmitters all at once.

[0057] On the other hand, since rewriting of a program of operation cannot be performed if the personal identification number of transmitter \*\*\*\* is not known, it has the effectiveness referred to as being able to prevent unprepared rewriting again. Moreover, since actuation of a transmitter will stop with the switch formed in housing covering if connection of a connector cannot be performed but housing covering is opened if the connector which sends in a program is prepared in the housing of a transmitter and housing covering is not opened If it is not those who have the facility which has the knowledge which reboots a transmitter or reboots a transmitter, a program of operation cannot be rewritten but it has the effectiveness referred to as being able to prevent rewriting of a program of operation with an amateur's mischief.

[0058] Moreover, it has the effectiveness which the owner of a transmitter does not need to memorize the formal number of a program [ in use ] of operation since the formal number of the program of operation currently used actually is displayed on the display of a transmitter, and is said that decision whether it is that for which the program of operation currently used needs exchange since it can know easily when it is arbitration can carry out also to an owner easily [ always ].

[0059] Moreover, since the program rewriting equipment for pocket transmitters of this invention can rewrite the program of two or more sets of pocket transmitters of operation to coincidence, its working efficiency of a program rewriting activity improves, and it has the effectiveness referred to as being able to reduce the latency time of the owner who wishes to rewrite.

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TECHNICAL FIELD

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PRIOR ART

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[0004] The control section 30 consists of required surrounding electronic parts, wiring, etc. which are not illustrated, when operating CPU1, ROM2 and RAM3, a bus 4, and these as hardware. Moreover, the transmitter 31 consists of a control section 30, the Radio Communications Department 34, a power supply section 28, wiring between them which are not illustrated, etc.

[0005] An example of the appearance of the conventional transmitter 31 is shown in transmitter outline drawing of drawing 10. The indicating equipment for housing covering with which 8 can remove a housing and 9 from a housing 8, and 17 displaying information required for a communication link, for example, a frequency, the other party's telephone number, the residue of a power source, etc. in drawing, and measuring an operator's facilities, and 40 are push-buttons. In addition, the push-button 40 and the indicating equipment 17 are contained with the block diagram of drawing 9 in the Radio Communications Department 34.

[0006] Next, the block diagram of drawing 9 explains actuation. In a transmitter 31, although other transmitters (not shown) or the communication link with a dial office (not shown) is performed by a power source being supplied by the Radio Communications Department 34 from a power supply section 28, operating a request is given to the Radio Communications Department 34 by the control section 30. The program 5 of operation for operating CPU1 beforehand is carried in ROM2 using the write-in equipment of the dedication which is not illustrated in the control section 30.

[0007] Even if ROM2 does not have a power source, the program 5 of operation carried does not disappear. If the power supply section 28 of a transmitter 31 is switched on, CPU1 will read the program 5 of operation carried in ROM2, and will start necessary actuation according to this. Although a part or all of the program 5 of operation may be transmitted to RAM3 if needed when operating, the program 5 of operation carried in ROM2 even in this case was not erased, and remains. RAM3 has memorized the password for the protection at the time of rewriting data with

the need of memorizing temporarily when CPU1 performs control and an operation, for example, system data, and system data etc. After a password exchanges at the time of starting of a system, i.e., the cell of a transmitter 31, it can be set as arbitration with a push-button 40.

[0008] A password is anew entered from a push-button 40, and only when this is in agreement with the password contained by RAM3, rewriting is performed in rewriting of the system data contained by RAM3. Although the thing of various formats is used for ROM2, like the pocket transmitter, stored data is eliminable, and the integrated circuit device which can make rewriting possible is inserted in the socket of dedication by only UV irradiation, and is used for the thing with the need of making it operating, it being small and carrying, by it. Since such a component does not need a power source for informational storage maintenance, even when exchanging the cell (not shown) of the power supply section 28 of a transmitter 31, a program does not disappear.

[0009] However, the program 5 of operation is not everlasting, for example, when as follows, it needs modification. If the case of portable telephone is explained as an example of a transmitter 31, in routing to the message other party, the cheap root of a tariff is automatically chosen from different telephone company lines of the 2 or more roots by telephone, the actuation which chooses the optimal root is required and the program for it is also included in the program 5 of operation.

[0010] However, a tariff needs to exchange the program 5 of the telephone of a large number which attain to tens of thousands of [ including the above-mentioned program ] of operation which is not often changed, and was manufactured and sold in the past for whenever [ of amendment of the tariff of each telephone company / every ] in order not to give a user disadvantageous profit since the result which does not suit the present condition by the old program came out for a short period of time.

[0011] Drawing 11 is the transmitter internal structure Fig. showing the situation that ROM2 is used for the conventional transmitter 31. 2, 8, and 9 are the same as that of drawing 9 and drawing 10 in drawing. The socket in which 6 inserts ROM2, the substrate with which 7 has attached the socket 6, and 18 are the formal numbers of the program 5 of operation written down in the front face of ROM2. Drawing shows the condition of removing the housing covering 9, on account of explanation.

[0012] although otherwise although not shown in drawing and most is arranged on the substrate 7, there is no need for explanation — it comes out — it is omitting. [ on circuitry including CPU1, RAM3, or them ] [ required electronic parts ] The activity from which ROM2 inserts ROM2 in a socket 6, or removes it since about 20-40 electrode guide pegs 10 are generally formed is handicraft, and if it does not pay and carry out careful cautions, a guide peg may break, and it may bend, a socket, or it may damage other surrounding components.

[0013] That is, it is difficult for an amateur, and in order that a special engineer may also carry out carefully, if exchange of ROM2 is only one set, it is easy, but when there is much number, it is the bad activity of working efficiency with large fatigue.

[0014] The approach of specifying the owner of the transmitter 31 which needs exchange of the program 5 of operation, and mailing ROM2 for exchange Since it is impossible, from that there is very much number of selling, and the reason it is told to an amateur that are difficult as exchange mentioned above the exchange approach of ROM2 ROM2 for exchange to which the manufacture manufacturer of a transmitter 31 released the formal number 18 of the program 5 of the format which needs exchange to the end user, and carried the new program 5 of operation in the electrical appliances store or the dial office first, The engineer who performs exchange is made to stand by and the approach of carrying out exchange of every one transmitter 31 which the user brought is taken.

[0015] Since it is necessary to read the formal number 18 which discovered ROM2 and was written there out of the electronic parts of many which opened the housing covering 9 in order for an owner to know the formal number of the program 5 of operation carried in ROM2, and have been arranged intricately which are not illustrated, it is difficult for an amateur's general owner.

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[Translation done.]

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since sampling of the read-only component which time and effort requires on the occasion of modification of a program of operation since the pocket transmitter of this invention does not use a read-only component for the storage element of a program of operation, and does not need a power source for storage maintenance but the storage element which can be written is used, and insertion are lost and it becomes rewritable in a program of operation by the signal, it has the effectiveness say that workability improves when rewriting a lot of pocket transmitters all at once.

[0057] On the other hand, since rewriting of a program of operation cannot be performed if the personal identification number of transmitter \*\*\*\* is not known, it has the effectiveness referred to as being able to prevent unprepared rewriting again. Moreover, since actuation of a transmitter will stop with the switch formed in housing covering if connection of a connector cannot be performed but housing covering is opened if the connector which sends in a program is prepared in the housing of a transmitter and housing covering is not opened If it is not those who have the facility which has the knowledge which reboots a transmitter or reboots a transmitter, a program of operation cannot be rewritten but it has the effectiveness referred to as being able to prevent rewriting of a program of operation with an amateur's mischief.

[0058] Moreover, it has the effectiveness which the owner of a transmitter does not need to memorize the formal number of a program [ in use ] of operation since the formal number of the program of operation currently used actually is displayed on the display of a transmitter, and is said that decision whether it is that for which the program of operation currently used needs exchange since it can know easily when it is arbitration can carry out also to an owner easily [ always ].

[0059] Moreover, since the program rewriting equipment for pocket transmitters of this invention can rewrite the program of two or more sets of pocket transmitters of operation to coincidence, its working efficiency of a program rewriting activity improves, and it has the effectiveness referred to as being able to reduce the latency time of the owner who wishes to rewrite.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Since the conventional pocket transmitter is constituted as mentioned above, if it is one transmitter, as the 1st technical problem Although exchange of a program of operation is not a time-consuming activity so much, either, in carrying out exchange of the program of a lot of sold transmitters at 1 cause Since there is also the number of activity engineers from the viewpoint of business, the owner who brought the transmitter for exchange has to do long duration turn waiting, or Or it will be necessary to deposit a transmitter in an electrical appliances store for several days, and there was a trouble said that workability is not good in the semantics said that it is unexchangeable that the inconvenience of being unable to use a transmitter in the meantime arises etc. in a short time. [0017] Moreover, as the 2nd technical problem, if it reregisters with arbitration even if it does not know a personal identification number although protection by the personal identification number registered into RAM at the time of system starting is made, rewriting of system data can be freely performed for rewriting of the system data contained to RAM. Moreover, in exchange of ROM, since protection of what was not performed, either, when the 3rd malicious person existed, the problem referred to as being easily exchanged for ROM including the converted program of operation was.

[0018] Moreover, as for the owner of a transmitter, in long-term duration of service, it is common as the 3rd technical problem for the formal number of the program of operation carried in the transmitter to own to have been what, or to forget. Moreover, the formal number of the program of operation is known only by an owner looking at a transmitter from the outside. For this reason, even if the transmitter manufacturer performed the appeal of program exchange, an owner did not perform the proposal of exchange but there was a problem referred to as that the transmitter which has the program of operation which does not suit the present condition as a result continued being used as it is.

[0019] Moreover, as the 4th technical problem, even when a special operator carried out, in exchange of a program of operation, i.e., exchange of ROM, there was no exchange of dedication etc., and since it could not but perform one set at a time manually, the problem said that working efficiency is low was.

[0020] It was not made in order that this invention might cancel the above troubles, and by changing exchange of a program of operation into the simple activity which does not need so much prudence, one is improving the workability of the simultaneous exchange activity of the program of a lot of transmitters of operation, and, thereby, it aims at reducing the latency time of the owner who brought the transmitter for exchange of a program.

[0021] Moreover, although the above-mentioned exchange is made easy, it aims at making it the system or structure where it is too easy and reconstruction by the 3rd malicious person etc. is not performed simply to the 2nd.

[0022] Moreover, of what kind of form the program of operation carried in the transmitter present in use the 3rd is a thing is completely being able to know easily also to an amateur's general owner at a technique, and memorizing the formal number of a program again.

[0023] Moreover, the rewriting working efficiency of a program is improved to the 4th, and it is provided with the program rewriting equipment which can reduce further the rewriting latency



time of the owner who brought the transmitter for program rewriting.

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**MEANS**

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[Means for Solving the Problem] About a pocket transmitter, the following means are used among the pocket transmitter concerning this invention, and its program rewriting equipment. Maintenance of storage is possible without a power source as a storage element which memorizes the program of operation in the 1st, and it has the interface section which has the electric type or the optical type connector for reading the new program of operation which should rewrite using RAM in which informational read-out and informational writing are possible with an electrical signal from external equipment, and it has the ROM which contained in the initial program which specified the actuation in the transmitter for writing said new program of operation in RAM.

[0025] Furthermore, this initial program starts write-in actuation of the new actuation program to said RAM, only when only the manufacturer knows, the personal identification number inputted from the external device and the personal identification number of said \*\*\*\* are contrasted, including the personal identification number data of \*\*\*\* of a pocket transmitter about which an owner is not told and this is in agreement.

[0026] As a connector of the interface section which reads said new program of operation into the 2nd from an external device further in addition to the 1st means, it is prepared in the housing of a transmitter, a switch is formed in housing covering which covers this connector, using the connector which has not been exposed outside, and this switch is connected to the power source of a transmitter.

[0027] When operating a transmitter further in addition to the 1st or 2nd means, the display with which the formal number of the program of operation carried actually is displayed is prepared in transmitter external surface the 3rd.

[0028] Next, it is carrying out to what has equipment which inputs the personal identification number shown in the 1st means of two or more sets of the transmitters connected to two or more interfaces the electric type which is program rewriting equipment which sends a program of operation into a transmitter from the exterior, and accesses two or more sets of transmitters about program rewriting equipment at coincidence in order to rewrite the program of the transmitter shown in the 1st means of operation, or with an optical type connector, and this interface.

[0029]

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## OPERATION

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[Function] Since a program of operation is contained by RAM, what is constituted as shown in the 1st [ of the transmitter by this invention ] of a means connects to an external device the connector prepared in the interface section on the occasion of that rewriting, is reading a new program of operation from an external device, and can perform rewriting of a program of operation. Moreover, unless it inputs the same number as the personal identification number written in the initial program carried in ROM from an external device, rewriting of a program of operation is not started.

[0030] If the connector which reads a new program of operation is prepared in the interior of a transmitter and does not disassemble covering of a housing, since it cannot connect the connector for rewriting, the transmitter of a configuration of being shown in the 2nd of a means has the operation to which an unprepared mischief is not carried out. Moreover, with the switch formed in housing covering, when housing covering is opened, a transmitter is turned off and there is an operation of easy mischievous prevention similarly.

[0031] In addition, when operating a transmitter further, an operator only reads the formal number of the program of operation displayed on the transmitter front face. an operation according [ the transmitter of a configuration of being shown in the 3rd of a means ] to said 1st means, and the operation by the 2nd means -- There is an operation which the format of the program of operation carried in this transmitter is what, or is actually referred to as being able to know easily without needing special technological knowledge.

[0032] As for the program rewriting equipment of a configuration of being shown in the 4th of a means, one program rewriting equipment can rewrite the program of two or more sets of transmitters of operation to coincidence at coincidence. Therefore, it acts so that effectiveness of the rewriting activity of the program of a lot of transmitters of operation may be made high.

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EXAMPLE

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[Example] The control-section block diagram of drawing 1 explains one example of this invention below example 1. Since 30 is the same as usual as 1, 3-5 in drawing, explanation is omitted. 11 is the storage element which can be written and the interface section for what does not need a power source for maintenance of storage (for there to be a flash memory, an ELECTRICALLY ERASABLE AND PROGRAMMABLE ROM, etc., for example, although it is henceforth called EEPROM), and 12 to connect EEPROM11 and the external device which is not illustrated, and 13 are the connectors of the electric type which connects an external device with the interface section 12, or an optical type.

[0034] It is read-only and initial-program write-in equipment (it is henceforth called IPL) for 14 to perform actuation which reads the program 5 of operation from an external device (not shown) via a connector 13 and the interface section 12 regardless of whether the program 5 of operation is carried, and is written in EEPROM11, and 15 are storage elements which were built into IPL14 and which do not need a power source for storage maintenance. Since the locations currently used although it is the same object as ROM2 differ, in order to distinguish component hardware, it calls it IPLROM henceforth for convenience. 16 is an initial program which carries out the aforementioned predetermined actuation to IPL14, and is carried in IPLROM15. 19 is the personal identification number of \*\*\*\* of the transmitter 31 contained in the initial program 16. An owner was not told about the personal identification number, but only the manufacturer of a transmitter 31 knows it.

[0035] In order to explain the configuration of an example 1 in more detail, the outline of the program included in the initial program 16 and the program 5 of operation of the manufacture department 30 of drawing 1 or data is shown in Table 1. Although the program 5 of operation can also be further divided into a detail in Table 1, since there is no need here, it is not shown for details.

[0036]

[Table 1]

プログラム 種 別	搭載されているプログラムまたはデータ
初 期 プログラム (16)	1) インターフェース等を駆動して、外部装置から、 新しい動作プログラムを読込むためのプログラム。
	2) PRAMに入っている動作プログラムを新しい プログラムで書き換えるためのプログラム。
	3) 通信機固有の暗証番号。
	4) 外部装置から入力された暗証番号と、固有の暗証 番号を比較し、一致した場合のみ2)に示す書き 換えを開始するプログラム。
動 作 プログラム (5)	1) 通信機としての動作のためのプログラム。
	2) プログラム形式番号。
	3) プログラム形式番号の表示動作プログラム。

[0037] In the control section 30 of drawing 1, since maintenance of storage is possible for it even if EEPROM11 does not have a power source, the program 5 of operation which has been memorized also in removing in order to exchange the cell (not shown) of a power supply section 28 etc. is not lost. Moreover, since rewriting of the memorized information can perform EEPROM11 easily only with an electrical signal, when the carried program 5 of operation needs to be rewritten, the program 5 of operation is rewritten with the following procedure.

[0038] First, the external device (not shown) which has the new program 5 of operation which should be rewritten is connected to a connector 13. Next, it inputs into the external device which does not illustrate the same input number (not shown) as the personal identification number 19 contained in the initial program 16. If said input number is sent to the interface section 12 through a connector 13 from an external device, within a transmitter, the old program 5 of operation memorized will stop, an initial program 16 will start, and the following actuation will be advanced according to an initial program 16.

[0039] First, in a control section 30, when the comparison with the sent input number and the personal identification number 19 of transmitter \*\*\*\* contained in the initial program 16 from the first is performed and it is in agreement with \*\*, a coincidence signal (not shown) is sent. In response to this coincidence signal, an external device turns the new program 5 of operation to a control section 30, and transmits, and the new program 5 of operation is written in in EEPROM11 by the control section 30. Although the old program 5 of operation will naturally be eliminated at this time, since a series of the above-mentioned actuation of all is performed by

the initial program 16 contained in IPL14, rewriting of a program etc. produces no trouble at all. [0040] Here, the personal identification number 19 of transmitter \*\*\*\* is a \*\*\*\* number of the format of that transmitter, and only the manufacturer of this transmitter grasps. Thereby, the opportunity of reconstruction of a program with the 3rd malicious person's, for example, a transmitter owner, mischief can be reduced.

[0041] One example of the transmitter of the example 2. example 2 is shown in the perspective view of drawing 2. Since the inside 7-9 of drawing is the same as that of the conventional example, explanation is omitted. 13 shows the attachment condition of the connector 13 in drawing 1. 29 is a switch which operates by closing motion of the housing covering 9. If the housing covering 9 is not opened in drawing 2, and it has the structure where an external device (not shown) is not connectable with a connector 13 and does not have the knowledge of fixed level, it has structure whose actuation is impossible.

[0042] An example of a circuit including the switch 29 of the transmitter shown in drawing 2 is shown in the power circuit Fig. of drawing 3. 31 in drawing shows the whole transmitter, 32 is the cell of a power supply section 28, and 33 is diode. The terminal a of a connector 13 is connected to the plus side of the power supply terminal of a control section 30 after Terminal b is connected to the cathode side of diode 33 on the plus pole of a cell 32 again. a and b terminal have connected 35 with \*\* too hastily by the other party connector of the external device (not shown) inserted in a connector 13. Although not illustrated, wiring for transmitting a program is connected to terminals other than a of a connector 13 and the other party connector 35, and b.

[0043] Since a switch 29 serves as close, and it will serve as open if the housing covering 9 is removed if the housing covering 9 is closed, where the housing covering 9 is removed, a power source is not supplied to the Radio Communications Department 34, but a communication link is impossible. If the housing covering 9 is closed, a power source will be directly supplied to the Radio Communications Department 34 through diode 33 also to a control section 30, and actuation of all the circuits in a transmitter 31 will be attained.

[0044] Even if a connector 13 is inserting the other party connector 35 and the switch 29 has not closed it by the short circuit of the other party connector 35 which should be inserted, a power source is supplied only to a control section 30. Therefore, the housing covering 9 is opened, and the preparation which will rewrite a program if the other party connector 35 of the dedication which prepared the short circuit is used is prepared, and fault, like a message call starts from the exterior during rewriting can also be prevented.

[0045] The method of forming a short circuiting switch on a substrate 7 as an approach of replacing with a short circuit by the connector 13 and the other party connector 35 which were shown in drawing 3 may be used. Moreover, the connector only for short circuits suitable on a substrate may be prepared. Moreover, you may carry out using a photodiode or a reed switch etc.

[0046] An example Fig. of the appearance of the transmitter of this invention example 3 is shown in example 3. drawing 4. Although 17 in drawing is a display similar to the display shown in the conventional example, it has the display function of the formal number 18 shown below. Although there is no need in the usual communication link actuation, the formal number 18 of the program 5 of operation is automatically displayed on a display 17, when a transmitter operates.

[0047] the operator of a transmitter reads the formal number 18 — moreover, the program 5 of the transmitter 31 which he owns of operation can judge whether it is what requires updating by getting to know the program formal number which one side takes updating released from a transmitter manufacturer or a dial office.

[0048] The transmitter block diagram for displaying the formal number 18 of drawing 4 is shown in drawing 5. When the power source of a transmitter 31 is switched on, after the formal number 18 of the program of operation contained in the program 5 of operation in EEPROM11 is transmitted to 1 \*\* RAM 3, it is read to a register 36. As a result of the data of a register 36 driving a display 17 via a driver 37, the formal number 18 of the program 5 of operation is displayed on a display 17. In addition, since the formal number 18 is written in in the program 5 of operation, if the program 5 of operation is updated, the formal number 18 will also be updated.

[0049] Example 4. drawing 6 is the block diagram showing an example of the configuration of the

program rewriting equipment of this invention. The central processing unit (it is henceforth called CPU) with which 20 controls program rewriting equipment and 21 controls program rewriting equipment 20 in drawing, and 22 are the stores which should be rewritten and which contained the new program of a transmitter 31 of operation, for example, the floppy disk or the read-only storage element is used (it is henceforth called F.D). 23 is a keyboard for people to operate program rewriting equipment 20, and can input a personal identification number (it is called henceforth T.B).

[0050] 24 is an interface which has the other party connector 35 for combining with a transmitter 31, and two or more sets of I.F24 and the connectors 35 which are called henceforth I.F are used. 25 is a communication link bus-bar which connects CPU21, and F.D22, T.B23 and two or more I.F24 to \*\*.

[0051] The transmitter 31 shows the condition that two or more sets were connected to program rewriting equipment 20. It is enough for the completely same output as coincidence not to be outputted to two or more other party connectors 35 in strict semantics, and to output to coincidence by the so-called time sharing or the batch-processing technique with program rewriting equipment 20, at extent which people sense as coincidence.

[0052] An example of the appearance of program rewriting equipment 20 is shown in drawing 7 . When using program rewriting equipment 20, after loading a new program of operation in F.D22 first, the transmitter 31 of the number required for two or more other party connectors 35 is connected. Next, the same number (it is henceforth called an input number) as the \*\*\*\* personal identification number 19 of the number of connection of a transmitter 31 is inputted from T.B23.

[0053] If a rewriting initiation command is inputted from T.B23 after all inputs are completed, program rewriting equipment 20 will transmit a new program of operation to two or more transmitters 31 to what it has been answered to the coincidence signal which showed the sequential input number to delivery and the inner example 1 of a transmitter 31 as. By actuation explained to the example 1, a transmitter 31 reads a new program of operation, and rewrites an old program of operation.

[0054] A part of power circuit of other examples 5 of this invention is shown in example 5. drawing 8 . The one electrode is connected to one electrode of the optical generation-of-electrical-energy component 41 and the power supply terminal of RAM3 by the optical generation-of-electrical-energy component for which 41 generates an electrical potential difference in response to an external light in drawing, and the cell only for RAM which 42 can charge [ which is used for RAM3 in dedication ]. In order that 43 may carry out ON OFF of the power source of a transmitter 31, the switch connected to the cell 32 and 44 are antisuckback diodes, and are used for the antisuckback of the optical generation-of-electrical-energy component 41, the antisuckback to the cell 42 only for RAM, and the antisuckback to a cell 32.

[0055] In the case of drawing 8 , the program 5 of operation memorized even if the required electrical potential difference of RAM3 is always secured by the cell 42 only for RAM at least and it removes a cell 32 for exchange does not disappear. Moreover, by the optical generation-of-electrical-energy component 41 or the cell 32, the cell 42 only for RAM is charged, whenever it is opportune. Cheap RAM3 (the so-called static RAM) can be used instead of generally using expensive EEPROM11 as a storage element of the program 5 of operation according to this approach, and it has the effectiveness referred to as economical.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the control-section block diagram of the transmitter by the example 1 of this invention.

[Drawing 2] It is the perspective view of the transmitter by the example 2 of this invention.

[Drawing 3] It is the power circuit Fig. of the transmitter of drawing 2 .

[Drawing 4] It is outline drawing of the transmitter by the example 3 of this invention.

[Drawing 5] It is the transmitter block diagram of the transmitter of drawing 4 .

[Drawing 6] It is the block diagram of the program rewriting equipment by the example 4 of this invention.

[Drawing 7] It is outline drawing of the program rewriting equipment of drawing 6 .

[Drawing 8] It is the power circuit of other examples 5 of this invention.

[Drawing 9] It is the block diagram of conventional telephone equipment.

[Drawing 10] It is outline drawing of the transmitter of drawing 8 .

[Drawing 11] It is the internal structure Fig. of the transmitter of drawing 9 .

### [Description of Notations]

1 Central Processing Unit

3 Storage Element Which Can be Written

5 Program of Operation

8 Housing

9 Housing Covering

11 Storage Element Which Storage Can be [ Having No Power Source and ] Possible, and Can be Written

12 Interface Section

13 Electric Type or Optical Type Connector

15 Read-only Storage Element

16 Initial Program

17 Display

18 Formal Number

19 Personal Identification Number

20 Program Rewriting Equipment

28 Power Supply Section

29 Switch

31 Pocket Transmitter

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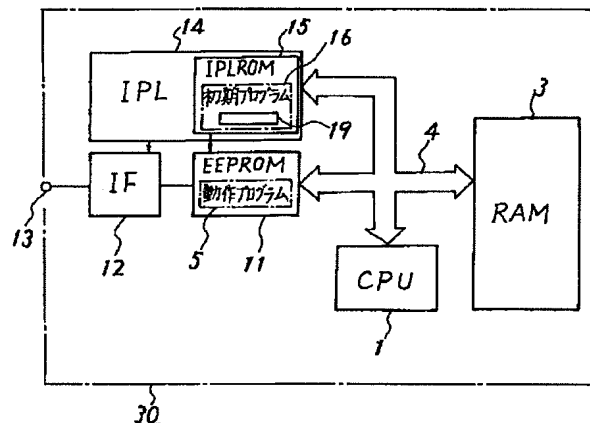
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(54)【発明の名称】 携帯通信機及びそのプログラム書き換え装置

(57)【要約】

【目的】 内蔵するCPUによって制御される携帯通信機のプログラム書き換え作業を、効率よく行えるように、又書き換えが容易すぎて、悪戯による改造は受け易くならないようにする。

【構成】 動作プログラム5を、電源無しで記憶可能で読み書き可能な記憶素子11に収納し、又インターフェース12とコネクタ13により、外部装置から書き換え用の動作プログラムを読込んで、電気信号により、プログラムの書き換えを行う。又書き換え動作はROM15に収納している初期プログラム16によって行う。更に初期プログラム16に収納している暗証番号19が外部装置から入力されなければ書き換えを行わないようにする。



1:中央処理装置

3:読み書き可能な記憶素子

5:動作プログラム

11:電源無しで記憶可能で読み書き可能な記憶素子

12:インターフェース部

13:電気式又は光式のコネクタ

15:読み出し専用記憶素子

16:初期プログラム

19:暗証番号

## 【特許請求の範囲】

【請求項1】 中央処理装置を有するプログラム制御式の携帯通信機において、電源無しで記憶可能であって電気信号により書き換えが可能な読み書き可能記憶素子と、携帯通信機として動作するための動作プログラムを外部装置から読み込むための電気式又は光式コネクタを備えたインターフェース部と、前記動作プログラムを読み込んで前記読み書き可能記憶素子へ書き込み動作を行うための初期プログラムを記憶した読み出し専用記憶素子とを備え、該初期プログラムは、該携帯通信機の個有暗証番号を備え外部装置から入力された暗証番号と前記個有暗証番号とが一致した場合のみ前記動作プログラムの書き込みを開始することを特徴とする携帯通信機。

【請求項2】 動作プログラムを外部装置から読み込むための請求項1記載のコネクタが、携帯通信機の筐体内に内設され、通信機の電源回路に接続されたスイッチに連動する筐体カバーにより、隠蔽されていることを特徴とする請求項1記載の携帯通信機。

【請求項3】 筐体外面に電気信号によって動作する表示装置を有し、記憶している動作プログラムを動作させる事により、該動作プログラムの形式番号を前記表示装置に表示する事を特徴とする請求項1又は2記載の携帯通信機。

【請求項4】 請求項1記載の携帯通信機に、前記動作プログラムを送り込むためのプログラム書き換え装置に於て、複数台の携帯通信機に、同時に接続するための電気式又は光式コネクタを有する複数のインターフェース部と、該インターフェース部に接続された複数の携帯通信機がそれぞれに有する請求項1記載の個有暗証番号に相応する番号を入力する入力装置とを有する事を特徴とする、請求項1記載の携帯通信機のプログラム書き換え装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】この発明は内蔵する中央処理装置により制御される携帯用通信機に関するものである。

## 【0002】

【従来の技術】従来の携帯用通信機には、その制御に中央処理装置（以後CPUと言う）を用いているものがある。CPUを用いて制御するにはCPUを動作させるための動作プログラムが必要である。ここでは電話装置を例に従来の例を説明する。図9は特開昭62-116099号公報に示されているのと類似の電話装置のブロック図であり、この図により従来の携帯用通信機の説明を行う。なお電話装置あるいは携帯用通信機のいずれについても以後、通信機と言う。

【0003】図9に於て、31は通信機を示し、28は通信機を構成する電源部、30は制御部、34は無線送受信部や表示装置、押ボタン等で以後無線通信部と言う。1は通信機31を制御するCPU、2はCPU1を動作させる動

作プログラムを収納する読み出し専用記憶素子（以後ROMと言う）、3はCPU1を動作させる上で、一時的に記憶する必要のあるデータ等を記憶する読み書き可能な記憶素子（以後RAMと言う）、4はCPU1とROM2とRAM3とを接続する信号母線（以後バスと言う）、5はROM2に収納されているCPU1を動作させるための動作プログラムである。

【0004】制御部30はハードウェアとしてはCPU1とROM2とRAM3とバス4とこれらを動作させる上で必要な図示しない周辺の電子部品及び配線等で構成されている。又通信機31は制御部30と無線通信部34と電源部28と、図示しないそれらの間の配線等で構成されている。

【0005】従来の通信機31の外形の一例を図10の通信機外形図に示す。図に於て8は筐体、9は筐体8から取はずし可能な筐体カバー、17は通信に必要な情報、例えば周波数や、相手方の電話番号、電源の残量等を表示して、操作者の便を計るための表示装置、40は押ボタンである。なお押ボタン40と表示装置17は図9のブロック図では無線通信部34に含まれている。

【0006】次に動作について図9のブロック図により説明する。通信機31に於て、他の通信機（図示しない）又は電話局（図示しない）との通信は無線通信部34により電源部28から電源を供給されて行われるが、無線通信部34に所望の動作を行わせるのは制御部30によって行われる。制御部30に於てROM2には図示しない専用の書き込み装置を用いて、あらかじめCPU1を動作させるための動作プログラム5が搭載されている。

【0007】ROM2は電源が無くても、搭載されている動作プログラム5が消えないものである。通信機31の電源部28が投入されると、CPU1はROM2に搭載されている動作プログラム5を読み出し、これに従って所要の動作を開始する。動作を行う上で必要に応じ、動作プログラム5の一部又は全部をRAM3へ転送する事はあるが、この場合でもROM2に搭載されている動作プログラム5は消される事はなく残っている。RAM3は、CPU1が制御や演算を行う上で一時的に記憶する必要のあるデータ、例えばシステムデータやシステムデータを書き換える際の保護のためのパスワード等を記憶している。パスワードはシステムの立上げ時、即ち、通信機31の電池を交換した後に、押ボタン40により任意に設定出来る。

【0008】RAM3に収納されたシステムデータの書き換えには、改めて押ボタン40からパスワードを入力し、これがRAM3に収納されているパスワードと一致した時のみ書き換えが行われるようになっている。ROM2には種々の形式のものが使用されているが、携帯通信機のごとく、小形で持運びつつ動作させる必要のあるものには、紫外線照射によってのみ記憶データを消去することが出来、書き換えを可能とすることの出来る集積回

路素子が、専用のソケットに挿入されて用いられている。このような素子は情報の記憶維持に電源を必要としないので、通信機31の電源部28の電池（図示しない）を交換する様な場合でも、プログラムが消えてしまう事がない。

【0009】しかし、動作プログラム5は永久不変のものではなく、例えば次の様な場合に変更を必要とする。通信機31の一例として携帯用電話器の場合について説明すると、電話器で通話相手方へのルート選択に於いて、2ルート以上の異なる電話会社線の中から、料金の安いルートを自動的に選択して、最適ルートを選ぶ動作が必要であり、動作プログラム5の中に、そのためのプログラムも含まれている。

【0010】しかし、料金はしばしば変更されるものであり、その結果、古いプログラムでは現状に合わない結果が出る事もあり、使用者に不利益を与えないためには各電話会社の料金の改定のたび毎に、過去に製造販売された、上記プログラムを含む数万台にも及ぶ多数の電話器の動作プログラム5を短期間で交換する事が必要である。

【0011】図11は従来の通信機31にROM2が用いられている状況を示す通信機内部構造図である。図に於て2、8、9は図9、図10と同様である。6はROM2を挿入するソケット、7はソケット6を取付けてある基板、18はROM2の表面に記入された動作プログラム5の形式番号である。図は、説明の都合上、筐体カバー9をはずしかけた状態を示している。

【0012】図には示していないがCPU1やRAM3あるいはそれらを含めた回路構成上必要な電子部品は他にも多数あり、大部分が基板7の上に配置されているが説明の必要がないので省略している。ROM2は一般に20～40本程度の電極足10が設けられているため、ROM2をソケット6へ挿入したり、取はずしたりする作業は手作業で、細心の注意を払って実施しなければ、足が折れ曲ったりソケットが故障したり、周囲の他の部品を傷付けたりする場合がある。

【0013】即ち、ROM2の交換は、素人にはむづかしく、専門の技術者でも、慎重に行わねばならないため1台だけなら簡単だが、台数が多いと疲労の大きい、作業効率の悪い作業である。

【0014】動作プログラム5の交換を必要とする通信機31の所有者を特定して、交換用のROM2を郵送する等の方法は、販売台数が大変多いことと、交換作業が前述した通り、素人にはむづかしいと言う理由から不可能であるため、ROM2の交換方法は、まず通信機31の製造メーカーが、交換を必要とする形式のプログラム5の形式番号18を一般使用者に対して公表し、電器店や電話局に新しい動作プログラム5を搭載した交換用のROM2と、交換作業を行う技術者とを待機させ、使用者が持参した通信機31を、1台ずつ交換作業する方法がとられて

いる。

【0015】ROM2に搭載されている動作プログラム5の形式番号を、所有者が知るためには、筐体カバー9を開き、複雑に配置された図示しない多くの電子部品の中から、ROM2をさがし出し、そこに書かれた形式番号18を読む必要があるため、素人の一般所有者には困難である。

【0016】

【発明が解決しようとする課題】従来の携帯通信機は以上の様に構成されているので、第1の課題として、通信機1台のみであれば、動作プログラムの交換はさほど手間のかかる作業でもないが、販売された大量の通信機のプログラムを一せいに交換作業する場合には、実務上は作業技術者の数にもかぎりがあるので、交換のため通信機を持参した所有者が長時間順番待ちしなければならなかったり、あるいは、通信機を電器店に数日間預ける必要が生じ、その間通信機を使用出来ないなどの不便が生じる等、短時間で交換出来ないと言う意味で作業性が良くないと言う問題点があった。

【0017】又、第2の課題として、RAMに収納しているシステムデータの書き換えには、システム立上げ時にRAMに登録した暗証番号による保護が、なされているとも言え、暗証番号を知らなくても任意に登録し直せば、システムデータの書き換えは自由に行う事が出来る。又、ROMの交換作業には、何の保護も行われていないため、悪意の第3者が存在した場合、改造した動作プログラムを含むROMと容易に交換されてしまうと言う問題があった。

【0018】又、第3の課題として、長期の使用期間中には、通信機の所有者は、所有する通信機に搭載されている動作プログラムの形式番号が何であったか、忘れてしまうのが普通である。又、所有者が通信機を外部から見るだけでは、その動作プログラムの形式番号がわからないようになっている。このため、通信機メーカーがプログラム交換の呼掛けを行っても、所有者が交換の申出を行わず、結果的に現状に適合しない動作プログラムを有する通信機が、そのまま使用され続けると言う問題があった。

【0019】又、第4の課題として、専門の作業者が行う場合でも動作プログラムの交換、即ちROMの交換には専用の交換機等はなく、1台ずつ手作業で行わざるを得ないため作業効率が低いと言う問題があった。

【0020】この発明は上記のような問題点を解消するために、なされたもので、1つは動作プログラムの交換作業を、それほどの慎重さを必要としない簡易な作業に変える事により、大量の通信機の動作プログラムの一斉交換作業の作業性を向上することであり、これにより、プログラムの交換のため通信機を持参した所有者の待ち時間を減らす事を目的としている。

【0021】又、第2には、上記交換作業を容易にする

とは言え、容易すぎて、悪意の第3者による改造等が簡単に行われることのないようなシステムあるいは構造にする事を目的としている。

【0022】又、第3には、現在使用中の通信機に搭載されている動作プログラムが、いかなる型式のものであるかが、技術には全く素人の一般所有者にも容易に知ることが出来、かつ又、プログラムの形式番号を記憶しておく必要がないようにすることである。

【0023】又、第4には、プログラムの書き換え作業効率を向上し、プログラム書き換えのため、通信機を持参した所有者の書き換え待ち時間を、更に減らす事の出来るプログラム書き換え装置を提供するものである。

【0024】

【課題を解決するための手段】この発明に係る携帯通信機及びそのプログラム書き換え装置の内、携帯通信機については以下の手段を用いる。第1には、その動作プログラムを記憶する記憶素子として、電源無しで記憶の維持が可能で、電気信号によって情報の読み出しと書き込みが可能なRAMを用い、書き換えるべき新しい動作プログラムを外部の装置から読み込むための電気式又は光式コネクタを有するインターフェース部を有し、前記新しい動作プログラムをRAMへ書き込むための通信機内の動作を規定した初期プログラムを収納したROMを有するものである。

【0025】更に、この初期プログラムは、製造者のみが知っていて、所有者には知らせていない携帯通信機の個有の暗証番号データを含み、又、外部装置から入力された暗証番号と前記個有の暗証番号とを対比し、これが一致した場合のみ、前記RAMへの新動作プログラムの書き込み動作を開始するものである。

【0026】第2には、第1の手段に加えて、前記新しい動作プログラムを外部装置から読み込むインターフェース部のコネクタとして、通信機の筐体内に設けられていて、外面に露出してないコネクタを用い、かつ、このコネクタをおおう筐体カバーにスイッチを設けるものであり、このスイッチは通信機の電源に接続されているものである。

【0027】第3には、第1又は第2の手段に加えて更に、通信機を動作させたとき、現に搭載している動作プログラムの形式番号が表示される、表示装置が通信機外面に設けられているものである。

【0028】次にプログラム書き換え装置については、第1の手段に示す通信機の動作プログラムを書き換えるため、外部から通信機に動作プログラムを送り込むプログラム書き換え装置であって、複数台の通信機に同時にアクセスする電気式又は光式コネクタ付の複数のインターフェースと、このインターフェースに接続された複数台の通信機の、第1の手段に示す暗証番号を、入力する装置とを有するものによることである。

【0029】

【作用】この発明による通信機の、手段の第1に示すように構成されているものは、動作プログラムがRAMに収納されるため、その書き換えに際してはインターフェース部に設けられたコネクタを外部装置に接続し、新しい動作プログラムを外部装置から読み込むことで、動作プログラムの書き換えが出来る。又、ROMに搭載された初期プログラムに書込まれた暗証番号と同じ番号を、外部装置から入力しないと動作プログラムの書き換えが開始されない。

【0030】手段の第2に示す構成の通信機は、新しい動作プログラムを読み込むコネクタが、通信機の内部に設けられていて、筐体のカバーを分解しなければ、書き換えのためのコネクタが接続出来ないで不用意な悪戯が行われない作用がある。又筐体カバーに設けられたスイッチにより、筐体カバーを開くと通信機の電源が切れ、同様に安易な悪戯防止の作用がある。

【0031】手段の第3に示す構成の通信機は、前記第1の手段による作用、及び第2の手段による作用に加えて、更に通信機を動作させたときに、操作者が通信機表面に表示された動作プログラムの形式番号を読みとるだけで、特別な技術的知識を必要とせず、現に、この通信機に搭載されている動作プログラムの形式が何であるか、容易に知る事が出来るという作用がある。

【0032】手段の第4に示す構成のプログラム書き換え装置は、1台のプログラム書き換え装置が、同時に複数台の通信機の動作プログラムを同時に書き換えることが出来る。従って大量の通信機の動作プログラムの書き換え作業の効率を高くする様に作用する。

【0033】

【実施例】実施例1. 以下、この発明の一実施例を図1の制御部ブロック図により説明する。図に於て1、3〜5と30は従来と同様であるので説明を省略する。11は、読み書き可能な記憶素子であって、記憶の保持に電源を必要としないもの（以後EEPROMと言うが、例えば、フラッシュメモリ、ELECTRICALLY ERASABLE AND PROGRAMMABLE ROM等がある）、12は、EEPROM11と図示しない外部装置とを接続するためのインターフェース部、13は、インターフェース部12と外部装置を接続する電気式又は光式のコネクタである。

【0034】14は、動作プログラム5が、搭載されているか否かに関係なく、外部装置（図示しない）からコネクタ13及びインターフェース部12を経由して動作プログラム5を読み込み、EEPROM11に書き込む動作を行うための初期プログラム書込装置（以後IPLと言う）、15は、IPL14に組込まれた読み出し専用で、記憶保持に電源を必要としない記憶素子である。素子ハードウェアはROM2と同じ物であるが使われている場所が異なるので、区別するため便宜上以後、IPLROMと言う。16はIPL14に前記の所定の動作をさせる初期

プログラムであり、PLROM15に搭載されている。19は初期プログラム16中に含まれた通信機31の個有の暗証番号である。暗証番号は所有者には知らせず通信機31の製造者だけが知っているものである。

【0035】実施例1の構成をより詳しく説明するため、表1に図1の製造部30の初期プログラム16と動作プ

ログラム5に含まれるプログラムやデータの概要を示す。表1に於て動作プログラム5は更に詳細に分ける事も可能であるがここでは必要がないので詳細は示さない。

【0036】

【表1】

プログラム 種 別	搭載されているプログラムまたはデータ
初 期 プログラム (16)	1) インターフェース等を駆動して、外部装置から、新しい動作プログラムを読込むためのプログラム。
	2) PRAMに入っている動作プログラムを新しいプログラムで書き換えるためのプログラム。
	3) 通信機固有の暗証番号。
	4) 外部装置から入力された暗証番号と、固有の暗証番号を比較し、一致した場合のみ2)に示す書き換えを開始するプログラム。
動 作 プログラム (5)	1) 通信機としての動作のためのプログラム。
	2) プログラム形式番号。
	3) プログラム形式番号の表示動作プログラム。

【0037】図1の制御部30に於て、EEPROM11は電源が無くても記憶の維持が可能であるので、電源部28の電池（図示していない）を交換するため取はずす等の場合にも、記憶している動作プログラム5が失われる事は無い。又、EEPROM11は記憶している情報の書き換えが電気信号のみによって容易に行うことが出来るので、搭載している動作プログラム5を書き換える必要が生じた場合には、次の手順によって動作プログラム5を書き換える。

【0038】まず、書き換えるべき新しい動作プログラム5を有する外部装置（図示しない）をコネクタ13に接続する。次に初期プログラム16に含まれている暗証番号19と同じ入力番号（図示しない）を図示しない外部装置に入力する。外部装置からコネクタ13を通じインターフ

ェース部12へ前記入力番号が送られると、通信機内では記憶されている古い動作プログラム5が停止し、初期プログラム16が起動して以下の動作が初期プログラム16に従って進められる。

【0039】まず、制御部30では、送られて来た入力番号と、もともと初期プログラム16内に含まれている通信機個有の暗証番号19との比較を行い、互に一致した場合には、一致信号（図示しない）を発信する。この一致信号を受けて外部装置は、新しい動作プログラム5を制御部30に向けて送信し、制御部30ではEEPROM11内に新しい動作プログラム5が書き込まれる。この時、当然、古い動作プログラム5が消去されることになるが、プログラムの書き換え等、上記の一連の動作は全て、PL14に含まれる初期プログラム16によって行われてい

るので、全く何の支障も生じない。

【0040】ここで、通信機個有の暗証番号19とは、その通信機の形式の個有番号であって、この通信機の製造者のみが把握しているものである。これにより悪意の第三者、例えば通信機所有者の悪戯によるプログラムの改造の機会を減らすことが出来る。

【0041】実施例2. 実施例2の通信機の一実施例を図2の斜視図に示す。図中7~9は従来例と同様であるので説明を省略する。13は図1に於けるコネクタ13の取付状態を示している。29は筐体カバー9の開閉によって動作するスイッチである。図2に於ては筐体カバー9を開かなければコネクタ13に、外部装置（図示しない）の接続を行うことが出来ない構造となっていて、一定レベルの知識を有するものでなければ操作が出来ない構造となっている。

【0042】図2に示す通信機のスイッチ29を含む回路の一例を図3の電源回路図に示す。図中31は通信機全体を示し、32は電源部28の電池、33はダイオードである。コネクタ13の端子aは電池32のプラス極に、又端子bはダイオード33のカソード側に接続された上、制御部30の電源端子のプラス側に接続されている。35はコネクタ13に挿入される外部装置（図示しない）の相手方コネクタでa、b端子が互に短絡されている。コネクタ13と相手方コネクタ35のa、b以外の端子には、図示しないがプログラムを伝送するための配線が接続されている。

【0043】スイッチ29は筐体カバー9を閉じれば閉となり、筐体カバー9をはずすと開となるので、筐体カバー9をとりはずした状態では無線通信部34に電源が供給されず、通信は出来ない。筐体カバー9を閉じれば無線通信部34には直接に、又ダイオード33を通じて制御部30へも電源が供給され、通信機31内の全回路が動作可能となる。

【0044】コネクタ13は挿入すべき相手方コネクタ35の短絡回路により、相手方コネクタ35を挿入することで、スイッチ29が閉じていなくても、制御部30にのみ電源が供給される。したがって筐体カバー9を開き、短絡回路を設けた専用の相手方コネクタ35を用いれば、プログラムの書き換えを行う準備が整えられ、又書き換え中に外部から通話呼出しがかかる等の不具合も防止できる。

【0045】図3に示したコネクタ13と相手方コネクタ35とによる、短絡回路に代る方法として、基板7上に短絡スイッチを設ける方法でもよい。又基板上に適当な短絡専用のコネクタを設けてもよい。又フォトダイオードやリードスイッチを用いる等してもよい。

【0046】実施例3. 図4に本発明実施例3の通信機の外形の一例図を示す。図中17は従来例に示す表示装置と類似の表示装置であるが、下記に示す形式番号18の表示機能を有するものである。動作プログラム5の形式番号18は、通常の通信操作には全く必要がないが、通信機

が動作することによって表示装置17上に自動的に表示される。

【0047】通信機の操作者は形式番号18を読むことにより、又一方で、通信機メーカーや電話局から公表される更新を要するプログラム形式番号を知ることにより、自分が所有する通信機31の動作プログラム5が更新を要するものか否か判断することが出来る。

【0048】図4の形式番号18を表示するための通信機ブロック図を図5に示す。EEPROM11内の、動作プログラム5の中に収納されている動作プログラムの形式番号18は、通信機31の電源を投入した時、一担RAM3に転送された後、レジスタ36に読出される。レジスタ36のデータはドライバ37を経由して表示装置17を駆動する結果、表示装置17に動作プログラム5の形式番号18が表示される。なお、形式番号18は動作プログラム5の中に書き込まれているため、動作プログラム5を更新すると形式番号18も更新される。

【0049】実施例4. 図6は本発明のプログラム書き換え装置の構成の一例を示すブロック図である。図に於て20は、プログラム書き換え装置、21は、プログラム書き換え装置20を制御する中央処理装置（以後CPUと言う）、22は、書き換えるべき、通信機31の新しい動作プログラムを収納した記憶装置であり、例えばフロッピーディスク、あるいは読み出し専用記憶素子等が用いられている（以後F、Dと言う）。23は、プログラム書き換え装置20を、人が操作するためのキーボードで、暗証番号を入力することが出来る（以後T、Bと言う）。

【0050】24は、通信機31と結合するための相手方コネクタ35を有するインターフェースであり、以後I、Fと言う。I、F24とコネクタ35とは複数組用いられている。25は、CPU21と、F、D22とT、B23と複数個のI、F24とを互に接続する通信母線である。

【0051】通信機31は複数台がプログラム書き換え装置20に接続された状態を示している。プログラム書き換え装置20では、厳密な意味では複数の相手方コネクタ35に完全に同時に同じ出力が出力される必要はなく、いわゆるタイムシェアリングあるいはバッチ処理手法等により、人が同時と感じる程度に同時に出力を行う事で十分である。

【0052】プログラム書き換え装置20の外形の一例を図7に示す。プログラム書き換え装置20を使用する上では、まず、新しい動作プログラムをF、D22に装荷した上で、複数個の相手方コネクタ35に必要な台数の通信機31を接続する。次に、通信機31の接続台数相当分の個有暗証番号19と同じ番号（以後、入力番号と言う）をT、B23から入力する。

【0053】全ての入力完了後に、書き換え開始指令をT、B23から入力すれば、プログラム書き換え装置20は、複数の通信機31に順次入力番号を送り、通信機31の内実施例1に示した一致信号が返信されて来たものに

対して、新しい動作プログラムを送信する。通信機31は実施例1に説明した動作により、新しい動作プログラムを読み込んで、古い動作プログラムを書き換える。

【0054】実施例5. 図8に本発明の他の実施例5の電源回路の一部分を示す。図に於て41は外部の光を受けて電圧を発生する光発電素子、42はRAM3に専用的に用いられる充電可能なRAM専用電池でその片極は光発電素子41及びRAM3の電源端子の片極に接続されている。43は通信機31の電源を入切するため、電池32に接続されたスイッチ、44は逆流防止ダイオードであり、光発電素子41の逆流防止及びRAM専用電池42への逆流防止、及び電池32への逆流防止のため用いられている。

【0055】図8の場合、RAM3の必要な電圧は少くともRAM専用電池42で常時確保されており、電池32を交換のため取はずしても記憶している動作プログラム5が消えることはない。又RAM専用電池42は光発電素子41、あるいは電池32により、機会ある毎に充電される。この方法によれば動作プログラム5の記憶素子として、一般的には高価であるEEPROM11を用いる代りに安価なRAM3（いわゆるスタティックRAM）を用いる事が出来、経済的であると言う効果を有する。

【0056】

【発明の効果】この発明の携帯通信機は動作プログラムの記憶素子に読み出し専用素子を用いておらず、記憶保持に電源を必要とせず読み書き可能な記憶素子を用いているので、動作プログラムの変更の際には、手間のかかる読み出し専用素子の抜きとり、挿入作業が無くなり、信号によって動作プログラムの書き換えが可能となるので、大量の携帯通信機の書き換えを一齐に行う上で作業性が向上すると言う効果を有する。

【0057】又一方、通信機個有の暗証番号を知っていなければ動作プログラムの書き換えが出来ないので不用意な書き換えが防止出来ると言う効果を有する。又、プログラムを送り込むコネクタは通信機の筐体内に設けられており、筐体カバーを開かなければコネクタの接続が出来ず、筐体カバーを開くと筐体カバーに設けたスイッチにより通信機の動作が停止するので、通信機を再起動する知識を有するか、又は、通信機を再起動する設備を有する者でなければ、動作プログラムの書き換えを行うことは出来ず、素人の悪戯による動作プログラムの書き換えを防止出来ると言う効果を有する。

【0058】又、現に使用している動作プログラムの形式番号が通信機の表示装置上に表示されるので、通信機の所有者が、使用中の動作プログラムの形式番号を記憶している必要がなく、任意の時に容易に知る事が出来る

ので、使用している動作プログラムが交換を必要とするものであるか否かの判断が、所有者にもいつでも容易に行うことが出来ると言う効果を有する。

【0059】又、この発明の携帯通信機用プログラム書き換え装置は、同時に複数台の携帯通信機の動作プログラムを書き換える事が出来るので、プログラム書き換え作業の作業効率が向上し、書き換えを希望する所有者の待ち時間を減らす事が出来ると言う効果を有する。

【図面の簡単な説明】

【図1】この発明の実施例1による通信機の制御部ブロック図である。

【図2】この発明の実施例2による通信機の斜視図である。

【図3】図2の通信機の電源回路図である。

【図4】この発明の実施例3による通信機の外形図である。

【図5】図4の通信機の通信機ブロック図である。

【図6】この発明の実施例4によるプログラム書き換え装置のブロック図である。

【図7】図6のプログラム書き換え装置の外形図である。

【図8】本発明の他の実施例5の電源回路である。

【図9】従来の電話装置のブロック図である。

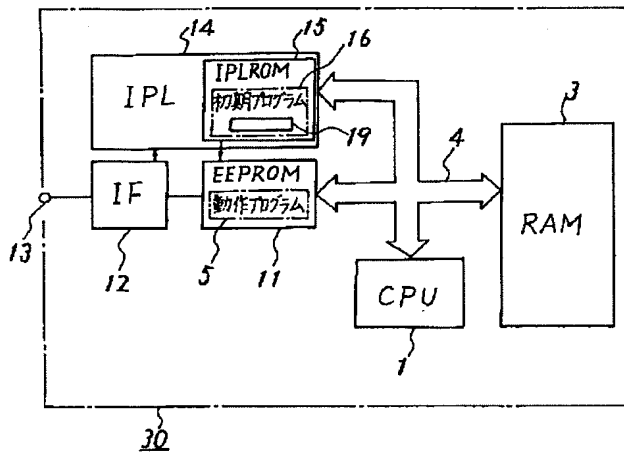
【図10】図8の通信機の外形図である。

【図11】図9の通信機の内部構造図である。

【符号の説明】

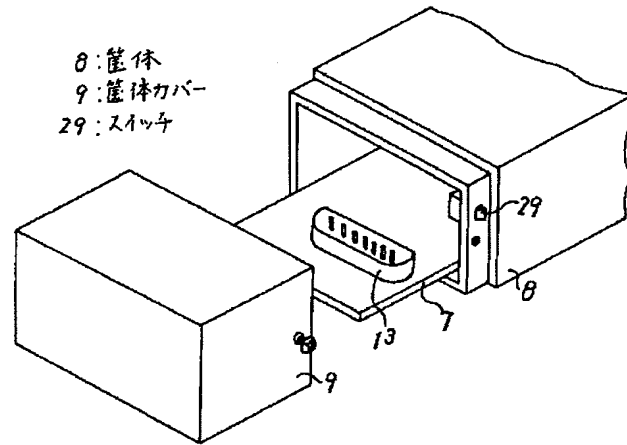
- 1 中央処理装置
- 3 読み書き可能な記憶素子
- 5 動作プログラム
- 8 筐体
- 9 筐体カバー
- 11 電源無しで記憶可能であって読み書き可能な記憶素子
- 12 インターフェース部
- 13 電気式又は光式コネクタ
- 15 読み出し専用記憶素子
- 16 初期プログラム
- 17 表示装置
- 18 形式番号
- 19 暗証番号
- 20 プログラム書き換え装置
- 28 電源部
- 29 スイッチ
- 31 携帯通信機

【図1】



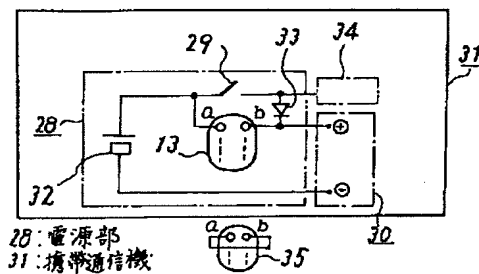
- 1: 中央処理装置  
 3: 読み書き可能な記憶素子  
 5: 動作プログラム  
 11: 電源無しで記憶可能で読み書き可能な記憶素子  
 12: インタフェース部  
 13: 電気式又は光式のコネクタ  
 15: 読み出し専用記憶素子  
 16: 初期プログラム  
 19: 暗証番号

【図2】



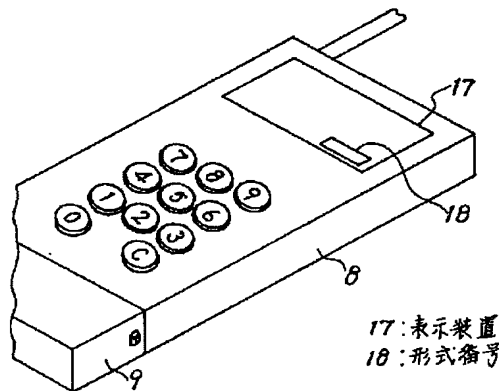
- 8: 筐体  
 9: 筐体カバー  
 29: スイッチ

【図3】



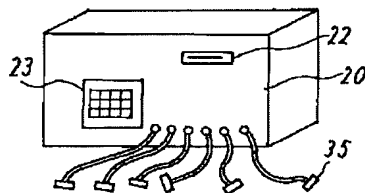
- 28: 電源部  
 31: 携帯通信機

【図4】

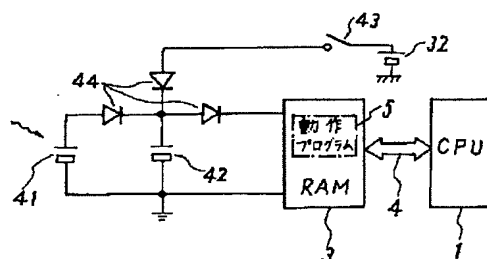


- 17: 表示装置  
 18: 形式番号

【図7】

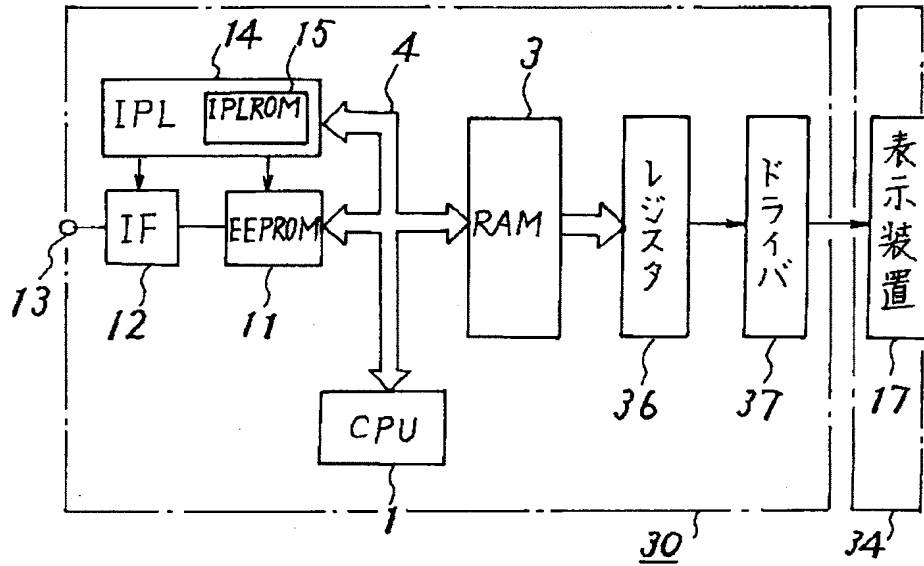


【図8】

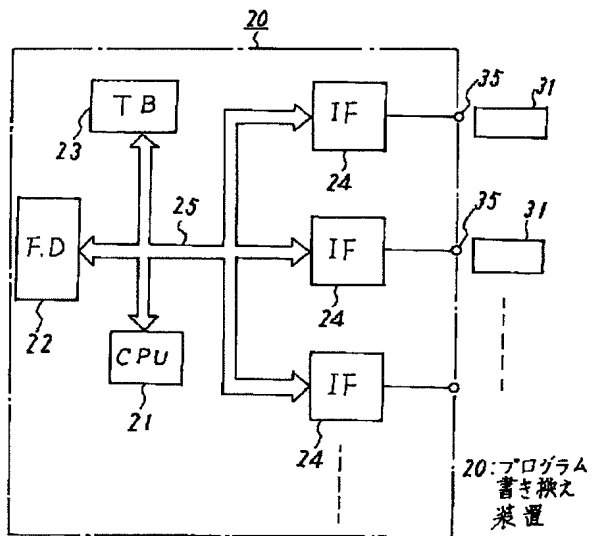




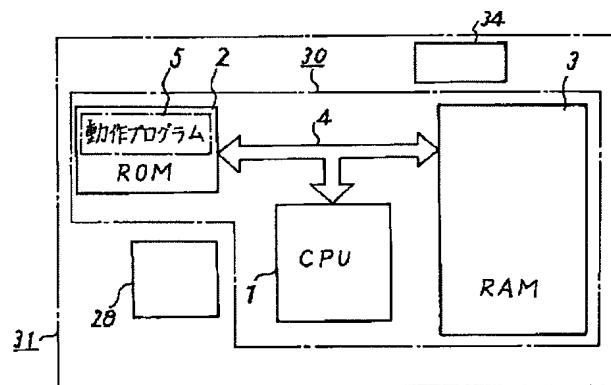
【図5】



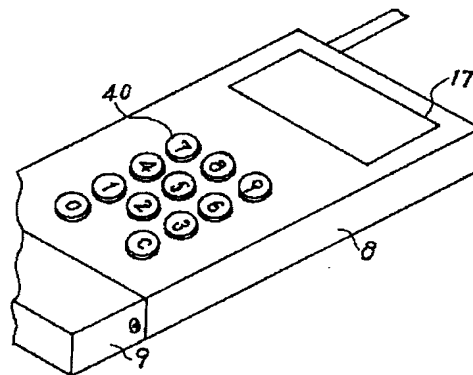
【図6】



【図9】



【図10】



【図11】

